# 01522

1992/03/28

SUPPLEMENT

REGARDING CHANGES IN SEISMIC EQUIPMENT AND
ADDITIONAL MATTERS
TO THE
AGREEMENT-IN-PRINCIPLE BETWEEN THE
STATE SEISMOLOGICAL BUREAU
OF THE PEOPLES REPUBLIC OF CHINA AND THE UNITED STATES
GEOLOGICAL SURVEY FOR UPGRADES TO THE
CHINA DIGITAL SEISMOGRAPH NETWORK

Both sides, the State Seismological Bureau (SSB) of the People's Republic of China and the United States Geological Survey (USGS), will continue to honor the responsibilities stipulated in the Agreement-in-Principle between the SSB and the USGS for Upgrades to the China Digital Seismograph Network (CDSN), with the following supplement as the addition to the Agreement-in-Principle with the consent of both sides.

1. Both sides agree that the equipment specified in the Agreement-in-Principle to be provided at stations of the CDSN should be replaced by the equipment specified on the list attached to this supplement. The equipment on this list will be provided at each of the 10 stations of the CDSN.

2. Both sides recognize the complex problem of satellite telemetry of CDSN data and both sides agree to work toward a mutually satisfactory solution of this problem.

3. The USGS agrees to provide the SSB, on a more timely basis, data from the worldwide network of digital seismic stations. This data will be provided on magnetic tape within approximately three months of original recording.

4. The USGS agrees to assist the SSB in the development and training of specialists in the application of digital seismic data in research and operations.

Signed:

Gu Ping, PRC Side

State Seismological Bureau.

Date: Mar. 28 1992

Signed:

USA Side

United States Geological Survey.

Date: 3 March 1992

EQUIPMENT AND SOFTWARE TO BE SUPPLIED AT THE CDSN STATIONS & DAC
as part of the
SUPPLEMENT REGARDING CHANGES IN SEISMIC EQUIPMENT AND ADDITIONAL MATTERS
to the
AGREEMENT-IN-PRINCIPLE
between the
STATE SEISMOLOGICAL BUREAU (SSB) OF THE PEOPLE'S REPUBLIC OF CHINA
and the
UNITED STATES GEOLOGICAL SURVEY (USGS),
under Annex I of the Earthquake Studies Protocol, for
UPGRADES TO THE CHINA DIGITAL SEISMOGRAPH NETWORK (CDSN)

This list of equipment and software is for 11 stations (10 operating stations plus one spare). THE ACTUAL EQUIPMENT & SOFTWARE SUPPLIED WILL DEPEND ON COST, AVAILABILITY, AND EXPORTABILITY.

| QTY | MODEL | DESCRIPTION | MANUFACTURER | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| SEISMOMETERS: | | | | | |
| Standard Seismometers: | | | | | |
| 11 | | VBB Mod. kit for 1 STS-IV & 2 STS-III Seismometers | Streckeisen | $ 4,000 | $ 44,000 |
| 1 | | VBB Mod. kit for 1 KS-36000 Seismometer | Teledyne-Geotech | 6,000 | 6,000 |
| Optional Seismometers: | | (the option to be exercised, if any, will be decided by USGS & SSB) | | | |
| Option 1 (VSP): | | Very Short Period Seismometers and Accessories (3 stations only - use existing VSP at other 3 sites): | | | |
| 3 | sets | VSP SEISMOMETERS AND ACCESSORIES: | Teledyne-Geotech | $20,000 | $ 60,000 |
| 3 | GS-11 | Seismometer, Vertical | | | |
| 6 | GS-13 | Seismometer, Horizontal | | | |
| | | Modifications to existing CDSN SP amplifiers to change from 10 Hz to 25 Hz corner frequency | | | |
| Option 2 (LG): | | Low Gain Seismometers and Accessories (5 stations only plus 1 spare): | | | |
| 6 | FBA-23 | Force balance accelerometer, 2g | Kinemetrics | $ 3,000 | $ 18,000 |

(Note: Each station processor has 6 channels. Three of these channels are always used for the STS VBB seismometers. Only three channels are available for connection to optional seismometers. Therefore, any one station can have either the VSP option or the LG option, but not both.)

| QTY | MODEL | DESCRIPTION | MANUFACTURER | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| DATA LOGGING EQUIPMENT & SOFTWARE: | | | | | |
| Data Acquisition (DA) Module: | | | | | |
| 11 | CGBO/0X-GC | 6-channel Data Acquisition System with with GPS clock and sine wave calibrator | Quanterra | $38,100 | $422,400 |
| 11 | [illegible] | Application Software | Quanterra, ASL | ( - included - ) | |
| Data Processing (DP) Module: | | | | | |
| 11 | MI147BIS155CJ | VME Microprocessor System, 220 VAC, 50 Hz | Motorola | $17,845 | $196,295 |
| 11 | MVME945B-1 | Enclosure with 220V Power Supply | Motorola | | |
| 11 | MVME147SA-1 | Processor with 8MB DRAM (25 MHz) | Motorola | | |
| 11 | MVME712A/B | Transition Module | Motorola | | |
| 11 | MVME853F-5 | Tape and Disk Drives | Motorola | | |
| 11 | | Application Software | Quanterra, ASL | ( - included - ) | |
| 11 | | System License for OS-9 Operating System & Supporting Software: | Microware | $ 2,000 | $ 22,000 |
| 22 | [illegible]68NA201.1 | Professional OS-9/68020/30 for DA & DP | | | |
| 11 | PCL68NA68I.I | Pascal Compiler for DP | | | |
| 11 | ESP68NA68I.I | Ethernet Support Package for DP | | | |
| DP Accessories: | | | | | |
| 11 | MZ-8300 | Quad Serial Board with 6U Faceplate | Mizar | $ 495 | $ 5,445 |
| 22 | MZ-6610 | DAC Board | Mizar | $ 995 | $ 21,890 |
| 22 | 8300-CB | Cable | Mizar | $ 75 | $ 1,650 |
| 11 | GO-235 | Graphics Terminal, 220V/50Hz power | Graphon | $ 1,147 | $ 12,617 |
| 11 | KX-P1191 | Printer, Graphics, with Serial I/O | Panasonic | $ 250 | $ 2,750 |
| 11 | SCRF 024-1-20 | Battery Charger, 24V/20A | Exide | $ 1,805 | $ 19,855 |
| 22 | PMC-1290X | Battery, 12V, 90 Amp-Hour | Power Battery Co. | $ 190 | $ 4,180 |
| 33 | RS232E | Lightning Protector for RS-232 Port | Gen. Semicond. | $ 67 | $ 2,211 |
| 11 | RS422E | Lightning Protector for RS-422 Port | Gen. Semicond. | $ 78 | $ 858 |
| Analog Display: Laser Printer: | | | | | |
| 11 | J3048IAB | Laser printer, 220V/50Hz Power, with PostScript cartridge, 2 MB memory, parallel interface | Hewlett Packard | $ 3,000 | $ 33,000 |

| QTY | MODEL | DESCRIPTION | MANUFACTURER | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| DATA LOGGING EQUIPMENT & SOFTWARE (continued): | | | | | |
| DI* Accessories (continued): | | | | | |
| 11 | | Enclosure (Rack) | Optima | $ 926 | $ 10,186 |
| 11 | RC-701924 | Basic Cabinet | | | |
| 11 | ROSP-7024 | Side Panel (Pair) | | | |
| 11 | D-6119-LM | Solid Metal Door | | | |
| 11 | 2D-2119-LM | Acrylic Door | | | |
| 44 | P-0319 | 3.5" Panel | | | |
| 33 | P-0819 | 8.75" Panel | | | |
| 11 | HW-68 | Leveling Feet (set) | | | |
| 11 | PO-0712 | Power Output Strip | | | |
| | | Colors: White #931 for Bezel and Acrylic Door Frame. Blue #216 for Top, Base, Sides, Panels, & Door. | | | |
| The following telemetry links will be necessary at some stations (5 optical + spare MUXes, 1 RF) depending on DA-DP separation: | | | | | |
| 6 | ODS-302-G | 8-Channel RS-232 Asynch. Optical MUX, "ST" connector, 220V/50Hz power | Opt. Data Sys. | $ 1,200 | $ 7,200 |
| 6 | ODS-302-G | 8-Channel RS-232 Asynch. Optical MUX, "ST" connector, 24 VDC power | Opt. Data Sys. | $ 1,600 | $ 9,600 |
| 5 | ____ | Fiber Optic Cable, 1000 foot length, with pulling eye at each end, REMFO3 12-06-1-PI/06EX-06EX | (ASI) | $ 1,800 | $ 9,000 |
| 1 | ____ | RF link for BJI | Any | $10,000 | $ 10,000 |
| Station parts, supplies, tools, & test equipment: | | | | | |
| 11 | ____ | Station spare parts & supplies | (ASI) | $ 7,500 | $ 75,000 |
| 11 | ____ | Station tools, test equipment | (ASI) | $ 5,000 | $ 50,000 |
| STATION DATA ANALYSIS EQUIPMENT & SOFTWARE: | | | | | |
| (Note: At three stations, the existing Sun 4/65GX-8 workstations installed under the GSE program will be used. Seven more Sun workstations plus a spare will be provided for the other seven stations.) | | | | | |
| 8 | | Sun Workstation, Model IPC or equivalent, with laser printer and analysis software | Sun | $21,000 | $168,000 |

| QTY | MODEL | DESCRIPTION | MANUFACTURER | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|
| DATA MANAGEMENT CENTER (DMC): | | | | | |
| | | The existing CDSN DMC will be maintained until September 30, 1992, at which time maintenance of this equipment will become the responsibility of SSB. | | | |
| | | The GSE National Data Center (NDC) equipment will be upgraded with hardware and software necessary to read the DC600HC tape cartridges generated by existing CDSN stations and to read the SEED-format tape cartridges to be generated by the upgraded stations. | | | |
| 1 | --- | Labor, software, and equipment necessary to allow GSE NDC to process old-type and upgrade-type CDSN tape cartridges, and to function as the new CDSN DMC | (ASL) | $25,000 | $ 25,000 |